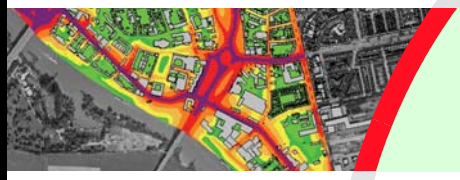
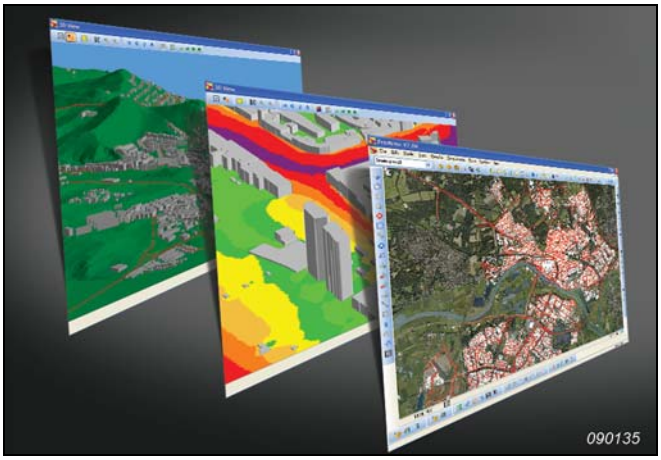


PRODUCT DATA

Predictor Version 7 — The Intuitive Solution (Types 7810-A/B/C/D/E/F/G)



Predictor™ is the most intuitive environmental noise calculation software package available. It allows you to calculate and analyse noise from various noise sources such as industry or traffic.

The software has a fast learning curve, enabling you to work efficiently, even for infrequent use. Model comparison is easy with its intuitive and unique multi-model view – particularly important for infrequent use, it's easier to remember what to do. You can model real-life quickly, easily and accurately, even in complex situations, e.g., flyovers, bridges with barriers, indoor-outdoor noise.

Predictor gets imperfect data into shape quickly and automatically with advanced geometrical post-processing and macros while, with the unique unlimited undo/redo functionality, modelling is faster as you avoid tricky repairs of mistakes. Once modeled, get results quickly with Predictor's fast calculations, without the need to purchase large numbers of licenses or computers. Powerful result analysis enables you to check the model and identify the main sources. Avoid tedious bookkeeping with automated data and result management using model versioning. In addition, real-life measured data from a noise monitoring system or a sound level meter, for example, Type 2250, can be used as input for source emission and for checking results. Predictor matches modern IT-hardware with dual core support as default and is cost-efficient as one license allows modelling on several linked PCs.

Different configurations are optimised for different applications, enabling Predictor to be used for all applications ranging from small-scale impact assessments to mapping of large agglomerations.

Uses and Features

Uses

- Environmental noise mapping, management, action planning and impact assessment
- Educational purposes

Features

- Compliance with a range of national and international calculation standards
- Fulfilment of European Commission directives such as Environmental Noise Directive (2002/49/EC) in accordance with Guidelines on Revised Interim Computation Methods (2003/613/EC) and the European Commission's Assessment of Exposure to Noise Working Group's Good Practice Guide
- Fulfilment of the IPPC Directive (96/61/EEC)
- Intuitive, powerful and modern
- Fast learning curve, even for infrequent use
- Easy model comparisons with unique multi-model view
- Accurate and intuitive modelling, also for complex situations, for example, fly-overs, bridges with barriers, indoor/outdoor noise
- Advanced and extendable geometrical post-processing using macros
- Quick repair of mistakes with unlimited undo functionality
- Fast calculations, among the fastest on the market
- Time saving integrated bookkeeping for model data and results
- Powerful result analysis and what if scenarios
- Cost-efficient – one license allows modelling on several linked PCs

Fast Learning Curve

Predictor has the most intuitive interface available. More than any other noise calculation software, Predictor has been designed according to the Windows® software design guide, helping you to be familiar with it from the very start – as installing and using Predictor is like any other Windows® software. Predictor software developers are skilled in implementing the handling of complex functionality in an intuitive manner and within the Predictor software developer group, there exists both software knowledge and knowledge of noise consultancy. The well organised data structure and integrated bookkeeping of a Predictor project is therefore based on many years of practical experience and good practice. This makes it easy to learn from the start, and it is extremely powerful for more experienced users. Predictor takes the weight off your shoulders by managing your data, and is quick to pick up if you only use the software infrequently. Environmental noise calculation is much easier with Predictor!

Clear and Intuitive Import and Export Options

Predictor has powerful options to import digital GIS data, enabling even large models with items such as roads, railways, buildings, terrain models, water surfaces and/or specific land usage areas to be setup quickly. After import all data can be modified, if needed, individually as well as simultaneously. Predictor offers edit, display and check options like 2D or 3D map views, cross-sections, sorted lists and complex geometrical editing using automated macros, unique to the Brüel & Kjær portfolio of calculation software. All data can be exported for use in other geographical applications like ArcGIS™, MapInfo™ and Google Earth™.

For General Planning and Detailed Studies

With Predictor, studies can be performed in a straightforward and intuitive manner. You can determine the level of detail. Starting with a global scenario, the possible alternatives can be determined and compared quickly within the same project structure, using the unique Model Manager. Then, the chosen scenario can be refined and studied in full detail.

For Visualisation of Possible Choices

Predictor is more than advanced calculation software. With Predictor, the results of the calculations can be viewed directly on top of digital geographical maps. Existing digital maps can be used as backgrounds to the model items and the transparent noise contours. In addition, the results can be analysed further with the Predictor Analyst module, producing conflict maps and noise exposure maps based on demographic information, such as the number of people annoyed by noise.

Fast and Accurate

The standardised calculation methods demand complex 3-dimensional calculations of all possible propagation paths from source to receiver. For this, Predictor uses smart search algorithms and optimisations that allow models to be calculated within minutes, or even seconds! At the same time, the calculation algorithms in the software have been optimised for speed, giving you results without undue waiting time. By using Predictor calculation clients and multi-core PCs, even very large models like complete cities can be calculated within one day.

Used Worldwide

Predictor is used worldwide by a large number of industries, consultants and authorities. In cooperation with feedback from our users, the software is continuously being developed and adapted to the latest needs, calculation methods and Windows® and IT platforms.

Integrated Project Management

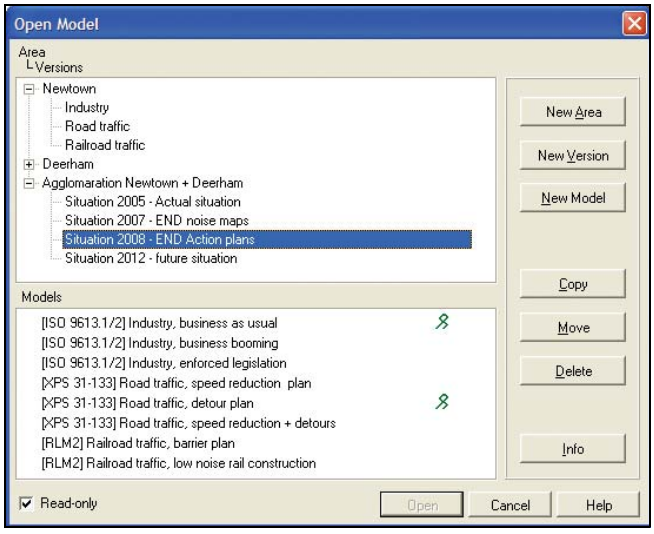


Fig. 1
Model Manager window

The Predictor concept focuses on structuring, organising and documenting a noise calculation project. A well structured and documented project will save valuable time, is always reproducible, gives insight to other users and will, therefore, lead to higher quality. Predictor differs from other software packages in the ease with which models and scenarios are created, compared and maintained.

The unique Model Manager (see Fig. 1) is the central point for data access in a Predictor project. All scenarios and action plans are maintained within one project. This enables you to focus on your work and not spend valuable time searching for the correct files on the network.

Multi-document Interface

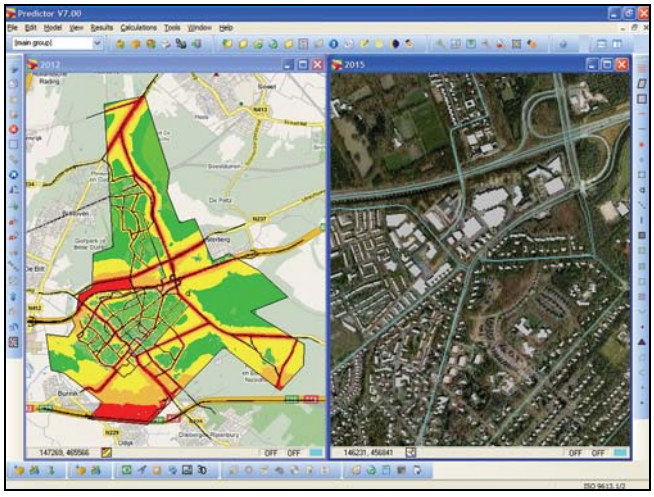


Fig. 2
Multi-document view

The intuitive multi-document view, (see Fig. 2) unique to Predictor, enables you to have several models open at the same time. This speeds up comparisons and enables intuitive copying and pasting of information from one model to another.

This clear and well-organised user interface is yet another example of how Predictor helps new users to learn the software and get results in a minimum amount of time.

Automated Data and Result Validation

Any project comprises both input data and results, requiring consistency between the two at all times, so that the results you see are what you modelled. To ensure consistency, Predictor validates new input data immediately at entry time, which is unlike any other software. Also, results that are invalid due to acoustic-relevant modifications are automatically set to be recalculated. This unique validation feature not only reduces recalculation time but, more importantly, ensures that results are always up-to-date and consistent with the input data. Results are, therefore, always reproducible, saving valuable time and leading to higher quality.

Data Entry from a Range of Sources

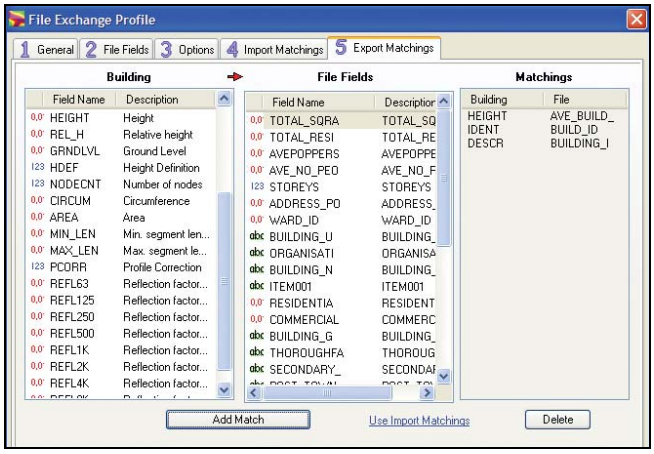


Fig. 3
Predictor is designed to accept vast amounts of data about the real world. Both geometrical data and attribute data can be imported (and exported) using the Data Exchange option. Geometrical data can contain point, polyline and polygon shapes. The external attribute data can be linked to Predictor's internal attribute data using the attribute matching option

Predictor has powerful and intuitive data entry options (see Fig. 3). The input data can be digitised on screen (snapping to a digital background file to ensure accurate modelling), imported directly from digital data files, or digitised on a graphics tablet using paper maps. Digital input data and background files can come from sources such as traffic flow systems, CAD and GIS systems. Through the GIS data import, models from different calculation software can be imported for use in Predictor, easing comparative and additional work. In addition, measurements can be read in directly from the Brüel & Kjær Type 2250 (or Environmental Noise Management Software Type 7843) for checking your calculated results against measurements on the model view, or in tables using the Control Values feature of Predictor (see Checking Results Against Limits and Measurements).

Item Attribute Validation and Model Checking

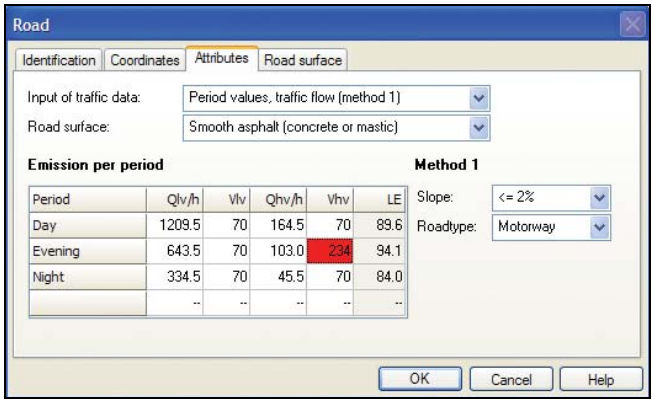


Fig. 4
XPS road attribute window (with range checking error indication)

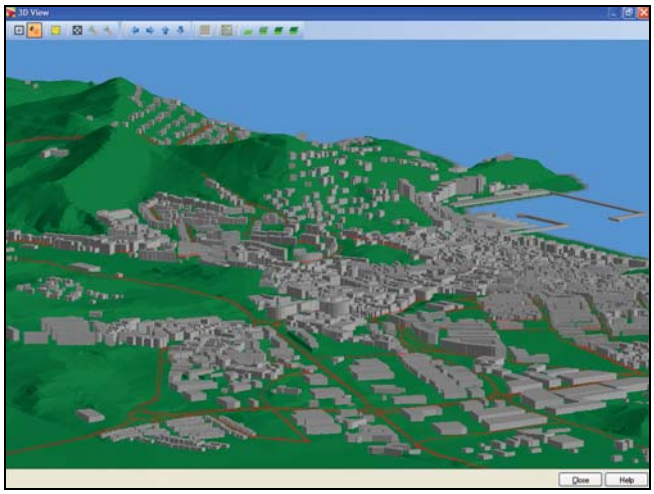
When entering items, all attributes are automatically validated and a range check is performed. On entering an invalid value a clear warning message is displayed and the attribute can be modified (see Fig. 4). Also, the complete model is automatically checked to identify potential problems and unintended mistakes, like duplicate items or zero heights. This saves valuable modeling time, avoids fixing problems due to error messages during the calculation, prevents unnecessary calculations and ensures result quality.

Model Refinement

Editing of multiple sources and other model items enables rapid model adjustment – simply select the objects to edit and change the common attributes in one go. In addition, other simple but powerful tools, such as search and select, cross-sections, distance measurement and 3D visualisation help you build an accurate model. Also, even in the 3D view, all items can be edited, easing quality assurance of the model. Noise receiver points, with up to 6 receiver heights, can be automatically positioned at a defined distance from landmarks such as buildings and roads to speed up modelling. Mistakes can easily be corrected using the undo/redo functionality which, uniquely, is unlimited so that you can go as far back as required to correct model changes.

3D Terrain Model

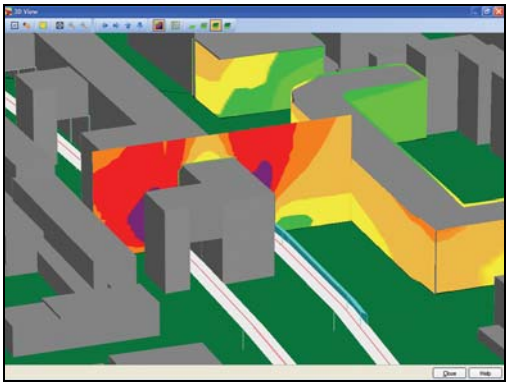
Fig. 5
3D Terrain Model



The 3D terrain model (see Fig. 5) with all ground level heights is automatically created when height lines and/or height points are imported. Items, such as buildings, are mapped on top of the terrain model making it easy to create useful real-life models from input data. Horizontal or vertical grids of receiver points can be created for mapping noise contours.

Easy Modelling, also for Complex Situations

Fig. 6
Left: 3D view with bridge and cantilever barrier
Right: 3D view with indoor/outdoor noise



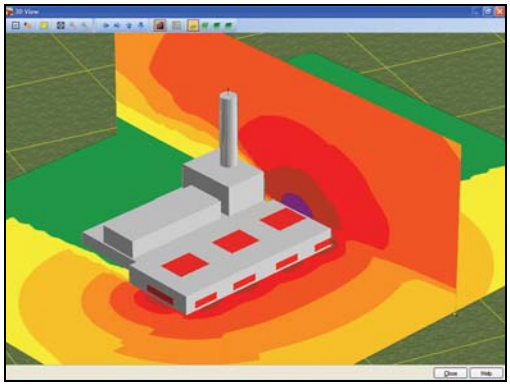
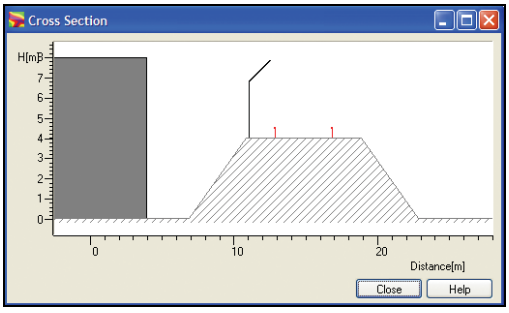


Fig. 7
Left: Cross-section view of road with embankment and cantilever barrier
Right: Model view with satellite image as background



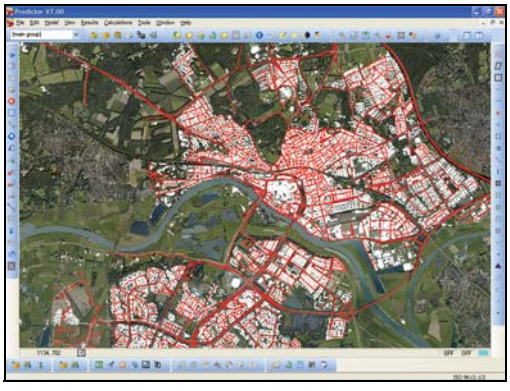
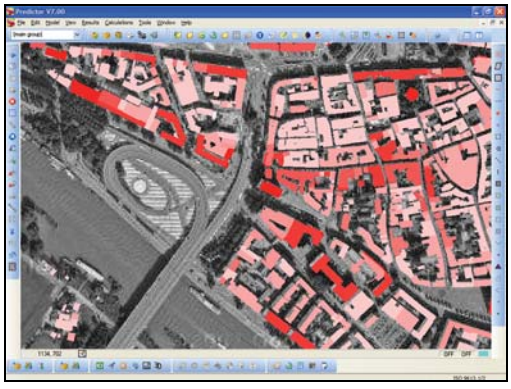
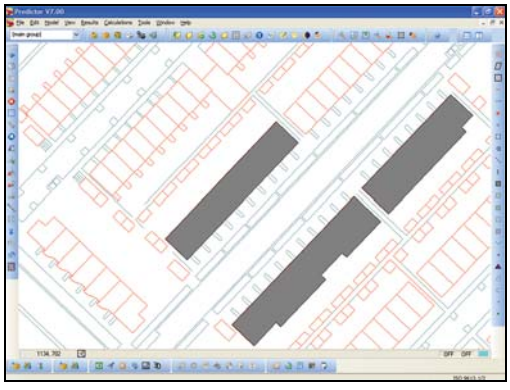


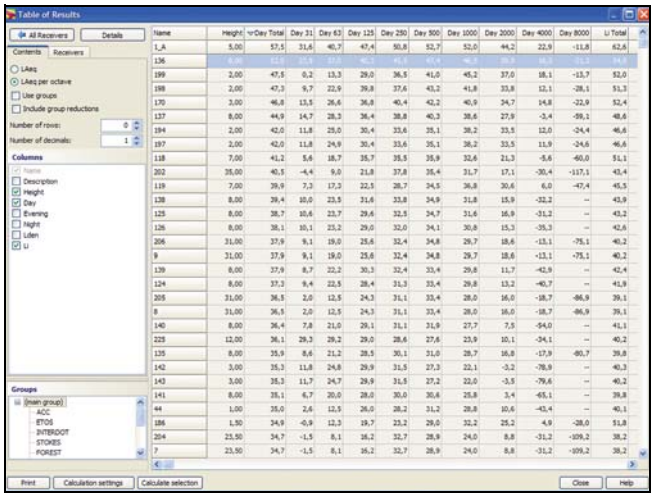
Fig. 8
Left: Model with thematic display of building heights
Right: Model view with DXF background as snap option for buildings





Ranking Sources

Fig. 9
Table of results

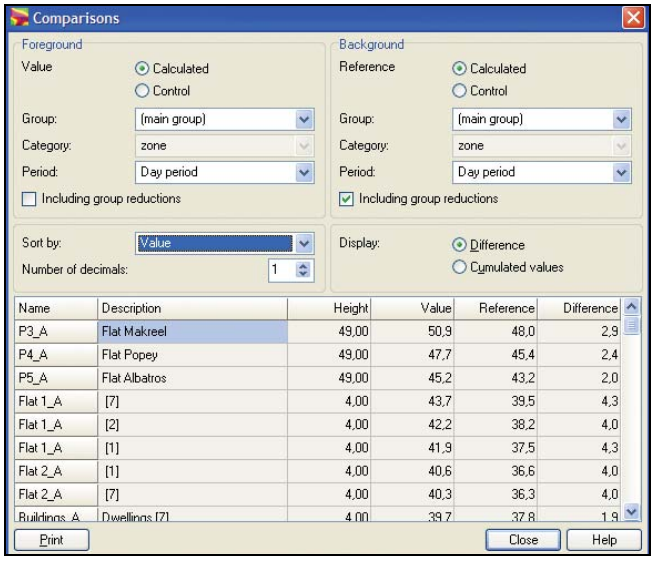


By using intuitive tables (see Fig. 9), Predictor ranks the individual noise sources (or groups of noise sources) on demand, clearly showing the importance of each source (or group of sources) enabling rapid troubleshooting and advice on noise reduction activities.

'What If' Scenarios

The effect of noise reduction can also be studied by introducing a reduction to the emission of a source (or groups of sources). Predictor immediately makes available 'what if' results, for example, 'what if the speed of the traffic is reduced from 110 km/h to 100 km/h?' or 'what happens if all exhaust ventilators are reduced by 6 dB?' without you having to start a calculation. Moreover, colour-coded, sound pressure contours visualise the situation in an easy to understand way and with the multi-model view, scenarios can easily be compared.

Fig. 10
Table of comparisons



Predictor also allows you to compare variants of a model in tabular form (see Fig. 10). This enables you to analyse and document the differences between variants, for example, differences in traffic flow, additional barriers, etc. Two variants of a model can be loaded as foreground and background variants.

The differences in sound levels at receiver points can be displayed in a comparison table, while the model view shows the levels of both model variants for all receiver points, thus enabling comprehensive comparison and analysis.

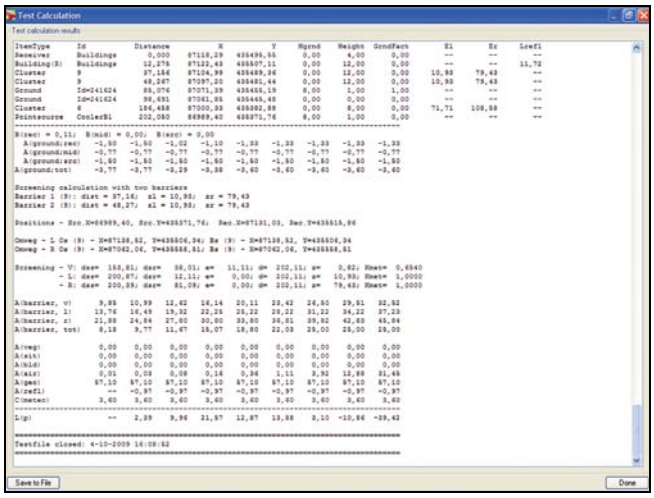
Checking Results Against Limits and Measurements

Predictor helps you check your results against legal limits or measurements by defining these within a Predictor model as 'Control Values'. These can be compared against the noise levels calculated for the model on the model view as labels at receivers, or in the 'Table of Control'. In the Table of Control, receivers are automatically ranked by how much calculated values exceed the selected Control Value. From the Table of Control you can easily zoom in to the Table of Results to see the dominant source that is responsible for exceeding the Control Value.

Detailed Result Validation Output

Predictor is not a black box. With Predictor you can zoom into the calculation for any source/receiver combination to see all propagation paths and the calculated attenuations.

Fig. 11
Test calculation window



This output can be used to validate the model, see where attenuation can be increased for lower noise levels and also to learn more about the calculation method, see the example in Fig. 11.

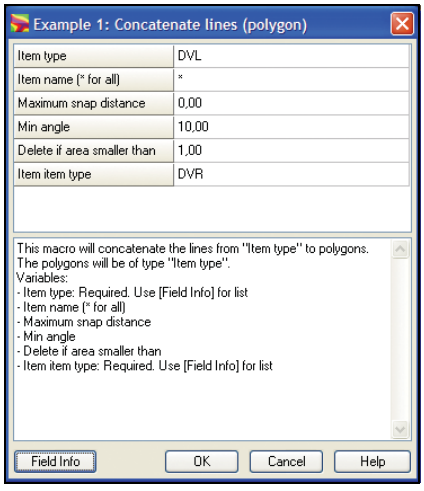
Advanced Geometrical Post-processing

Data Cleaning

For large models, data is normally imported directly into Predictor from GIS systems. Depending on the quality of this GIS data, some additional data cleaning may be necessary. These days, as quality GIS data becomes more readily available, the need for data post-processing and data cleaning becomes less. However, the need is still there, particularly for older data. In order to ease and speed up the process, Predictor offers several automated data cleaning options such as simplifying geometry, removal of duplicate items, rescaling, moving, rotation, splitting and concatenation of polylines and polygons.

Automated Macros

Fig. 12
Macro field attribute window

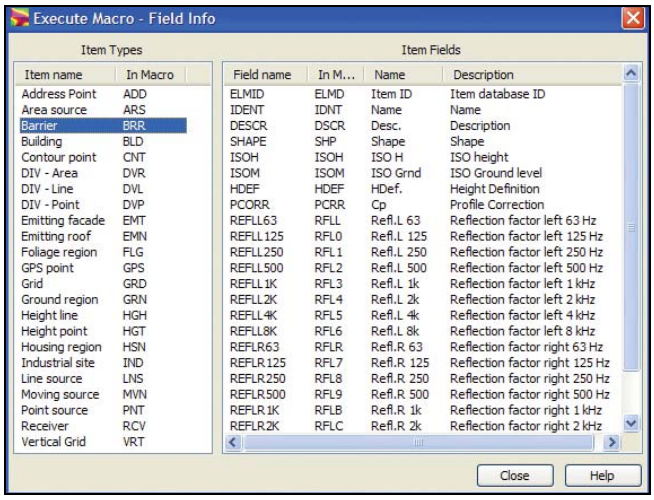


In cases with poor quality GIS/DXF data, such as crossing lines and non-closed objects, more specific data cleaning is needed. In this case, the macro functionality of Predictor Advanced Type 7810-B (unique to the Brüel & Kjær portfolio of calculation software) can be used. (See the example macro screens in Fig. 12 and Fig. 13.)

With Predictor Advanced Type 7810-B, user-definable macros can be added as options in the Predictor menu. With this option, both the geometry and the attributes of the items can be modified as needed for the specific project. In this way large amounts of data can be processed and cleaned automatically, and maybe even more importantly, data can be processed and cleaned 'reproducibly' – important in quality assurance issues.

The powerful macros are based on the Lima macro language. Additionally, selected items (if needed) can be transferred to the Lima5 interface (included) using a fully integrated link started from the Predictor menu.

Fig. 13
Exectute macro window


Execute Macro - Field Info
Item Types
Item name
In Macro
Address Point ADD
Area source ARS
Barrier BRR
Building BLD
Contour point CNT
DIV - Area DVR
DIV - Line DVL
DIV - Point DVP
Emitting facade EMT
Emitting roof EMN
Foliage region FLG
GPS point GPS
Grid GRD
Ground region GRN
Height line HGH
Height point HGT
Housing region HSN
Industrial site IND
Line source LNS
Moving source MVN
Point source PNT
Receiver RCV
Vertical Grid VRT
Item Fields
Field name
In M...
Name
Description
ELMID ELMD Item ID Item database ID
IDENT IDNT Name Name
DESCR DSCR Desc. Description
SHAPE SHP Shape Shape
ISOH ISOH ISO H ISO height
ISOM ISOM ISO Grnd ISO Ground level
HDEF HDEF HDef. Height Definition
PCORR PCRR Cp Profile Correction
REFLL63 RFLL Refl.L 63 Reflection factor left 63 Hz
REFLL125 RFL0 Refl.L 125 Reflection factor left 125 Hz
REFLL250 RFL1 Refl.L 250 Reflection factor left 250 Hz
REFLL500 RFL2 Refl.L 500 Reflection factor left 500 Hz
REFLL1K RFL3 Refl.L 1k Reflection factor left 1 kHz
REFLL2K RFL4 Refl.L 2k Reflection factor left 2 kHz
REFLL4K RFL5 Refl.L 4k Reflection factor left 4 kHz
REFLL8K RFL6 Refl.L 8k Reflection factor left 8 kHz
REFLR63 RFLR Refl.R 63 Reflection factor right 63 Hz
REFLR125 RFL7 Refl.R 125 Reflection factor right 125 Hz
REFLR250 RFL8 Refl.R 250 Reflection factor right 250 Hz
REFLR500 RFL9 Refl.R 500 Reflection factor right 500 Hz
REFLR1K RFLB Refl.R 1k Reflection factor right 1 kHz
REFLR2K RFLC Refl.R 2k Reflection factor right 2 kHz
Close
Help

Here, the full geoprocessing functionality of the Lima software is available for the Predictor user enabling extremely powerful functionality to get the data ready for use. Changes on the items made in the Lima5 interface are automatically passed on to Predictor for use.

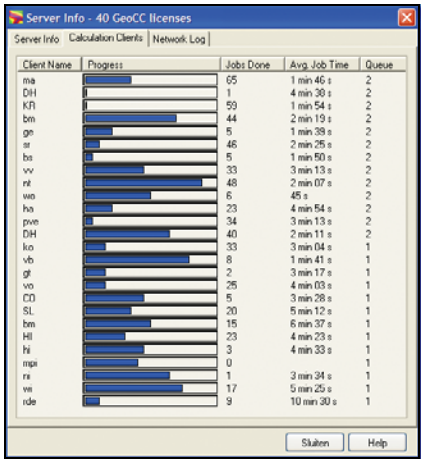
High Calculation Speed

Calculation Performance

Calculation performance is important in noise mapping, which is normally understood as mapping over a large area, for example, a large town or even an entire state. The task is often quite demanding, both in terms of computer capability and time. However, even for smaller tasks, calculation performance is important in order to reduce waiting time while the results are calculated, particularly as there are often hard deadlines to meet.

Predictor uses Lima calculation cores, which have been independently proven to be the fastest calculation cores available for CRTN and are probably the fastest on the market for other calculation methods. Large models for complete agglomerations can be made using Predictor Advanced Type 7810-B. Dual cores are supported as standard in all Predictor configurations, ensuring that you get the most out of your PC.

Fig. 14
The calculation progress information window showing the active clients and usage details



If needed, calculation time can be reduced even more with the Predictor multi-core option for quad core PCs[1] and/or a network calculation using Predictor's Calculation Client add-on package BZ-5552, installed on one or more workstations in the network. Execution of a network calculation is just as easy as running one locally on your own PC. Once the clients are installed on the other PCs, Predictor takes care of the distribution and monitoring of calculation jobs, see Fig. 14.

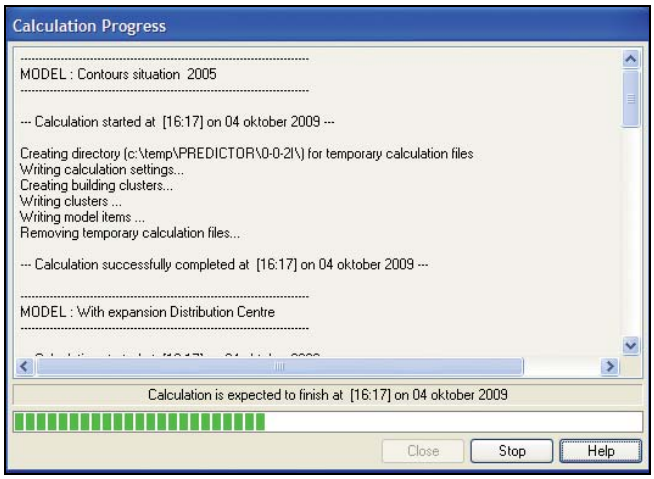
The Calculation Client itself has minimal impact on network and workstation performance, even when a calculation is active. The user of a workstation with a Calculation Client running effectively notices no drop in performance. Redistribution of failed jobs (for example, if a workstation is shut down during a calculation), is automatic, thus ensuring complete results.

Stop, Pause and Resume Calculation

Predictor always calculates the day, evening, night and compound (for example, L_{den}) period simultaneously. Calculations can be interrupted, refined, and then resumed.

1. BZ-5703 for Predictor Plus, BZ-5704 for Predictor Advanced.

Fig. 15
Calculation progress window


Calculation Progress
MODEL : Contours situation 2005
--- Calculation started at [16:17] on 04 oktober 2009 ---
Creating directory (c:\temp\PREDICTOR\0-0-2I\) for temporary calculation files
Writing calculation settings...
Creating building clusters...
Writing clusters ...
Writing model items ...
Removing temporary calculation files...
--- Calculation successfully completed at [16:17] on 04 oktober 2009 ---
MODEL : With expansion Distribution Centre
Calculation is expected to finish at [16:17] on 04 oktober 2009
Close
Stop
Help

Predictor will automatically calculate only those receivers and sources that are affected by modifications in the model, thus reducing total calculation time. The Batch Calculation option can be used to calculate several models/ scenarios in one run so that you can, if you prefer, focus on model creation and let Predictor calculate while you are busy doing other tasks. An example window showing a calculation in progress is shown in Fig. 15.

Export and Reporting

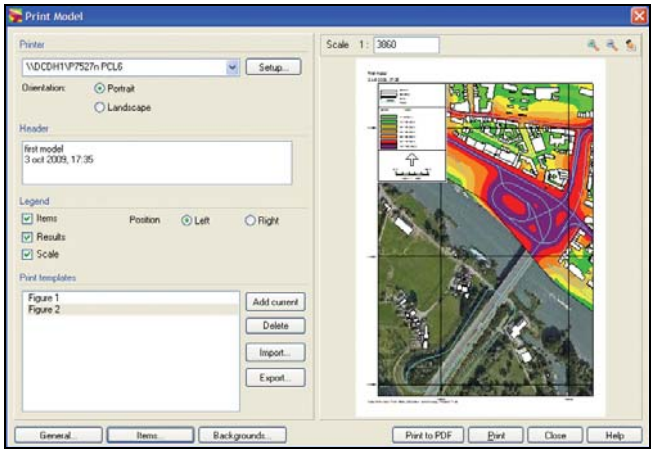
Export

Fig. 16
Display of noise contours for Arnhem, The Netherlands, using Google Earth

Both model data and model results can be exported for use in other geographical applications like ArcGIS™, MapInfo™ and Google Earth™ (see Fig. 16). With the intuitive data import/export wizard of Predictor you can even define your own export formats in case the receiving party requires a certain format. Standard export formats include SHP (GIS) and KML (Google Earth). With the export to KML, Predictor automatically calibrates the model and converts the data into global coordinates using GPS calibration point items. After saving the model in KML format, Predictor automatically starts Google Earth (if installed) and zooms to the model and calculated contours on top of the satellite image.

Reporting

Fig. 17
Print model window



Predictor has default and user-definable printing options for creating professional reports (see Fig. 17). The information that can be printed includes tabular information regarding the items, tabular information regarding the results and graphical views of the model. All information can be printed directly or stored in a PDF file for easy integration in a report. In all print options you can define text for headers and footers. The layout of the Table of Item Attributes can be modified by using item profiles, enabling you to define the most relevant attributes to be printed, thus

avoiding excessive information. Predictor offers diverse options for printing total results, ranked results and/or the results of the most dominant sources. The content and layout of the graphical model view can be interactively modified in WYSIWYG mode and stored as a re-usable print template.

Modules Included in Configurations

In addition to Predictor itself, the modules described below are available in all (or some) of the Predictor configurations.

SourceDB+ (Included in all Types)

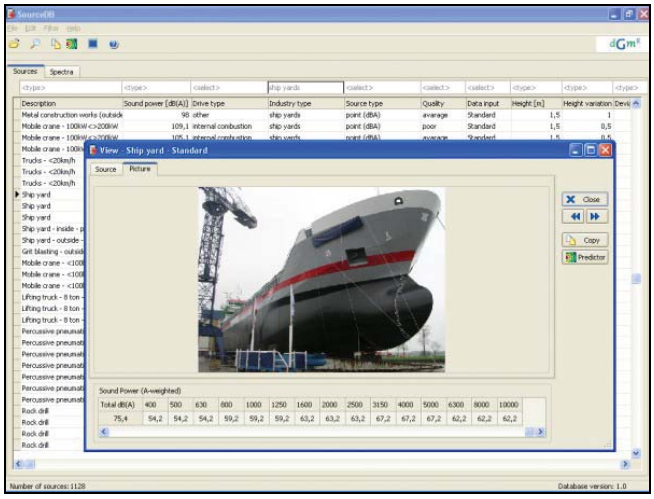


Fig. 18
Example SourceDB+ window

SourceDB+ is developed for the European Imagine project. The software contains a standard database for industrial noise sources and supplies data for applications in situations where measurement results cannot be used. The sources range from very specific individual noise sources (like a fork lift truck) to sound power levels for a type of industry as a whole (see Fig. 18). Next to this data, formulas can be used to predict sound power levels based on power consumption, rpm, etc. The sound power levels can be used directly as the input for a noise source in a Predictor model. Pictures of the sources are available for easier identification and use of similar sources where supplier data is missing. Users can create their own databases to add their own sources.

Acoustic Determinator Type 7816 (Included in Types 7810-A/B)

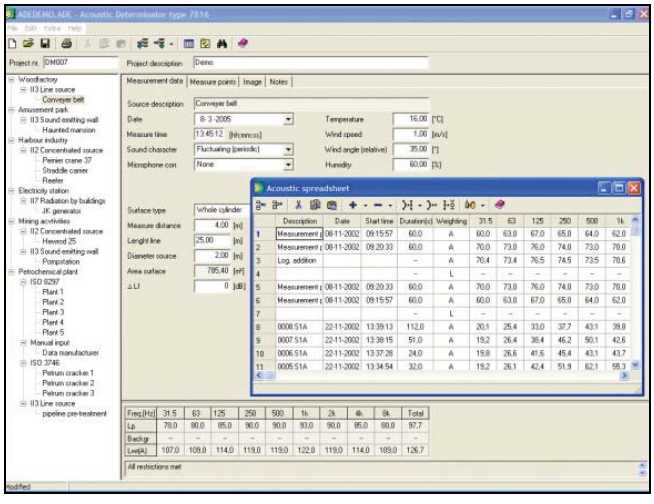


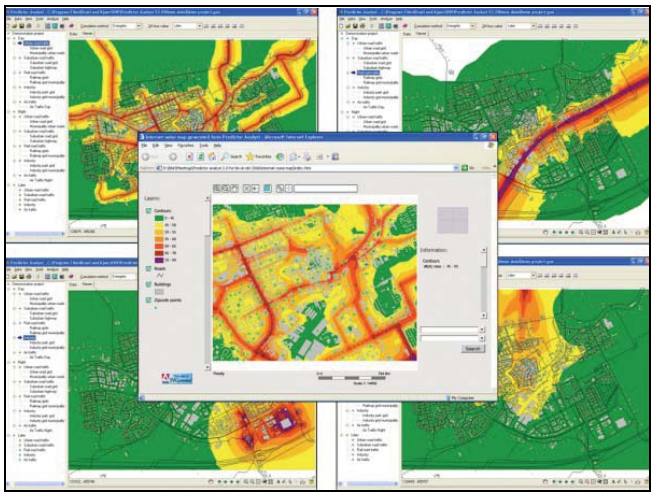
Fig. 19
Example Acoustic Determinator window

Acoustic Determinator is used to determine the sound power levels of industrial noise sources by measuring the sound pressure level according to ISO 3744, ISO 3746 and ISO 8297, as well as eight Dutch calculation methods (see Fig. 19). The sound power levels calculated in Acoustic Determinator can be used directly as input for a noise source in a Predictor model. Also available as separate product, Type 7816 (see Product Data BP 2003).

Predictor Analyst Type 7813 (Included in Type 7810-B)

This module has advanced GIS-like functionality for organising, accumulation, viewing, analysing and publishing of noise maps on the internet, see example screenshot in Fig. 20. The Analyst module enables you to obtain data that is required according to the EU Environmental Noise Directive, without the need to use an expensive GIS system. Both cumulated and difference maps can be created.

Fig. 20
Example Predictor Analyst windows showing noise contours from different sources and their accumulation exported to, and shown on, a website



All maps can be combined with demographic GIS data files in order to determine the noise exposure (of people/dwellings). Predictor Analyst enables results from different calculation software to be combined together (see Fig. 20).

Also available as a separate product, Type 7813 (see Product Data BP 2239).

New Features in Predictor Version 7

General Changes

- Easier installation, one installation program for Predictor 7810, Acoustic Determinator 7816 and Predictor Analyst 7813, Borland Database Engine no longer needed
- Modern, restyled appearance of the user interface with improved menu structure and icons
- User manual replaced by more extensive and searchable on-line help file
- Check on availability of new versions and updates from Help menu
- All configurations support dual-core processors as standard in order to get the most out of typical modern PCs
- All configurations include the model license allowing modeling on several linked PCs to the PC with the main Predictor license
- Predictor Standard Type 7810-G is expanded and now includes all implemented calculation methods

New Item Types

- Bridge: for modeling flyovers and underpasses
- Contour Point: for higher resolution where you want, for example, close to the sources, while keeping calculation time at a minimum. Grids and contour points are combined for contour calculations. Contour points can automatically be generated around sources. This allows you to combine a global regular grid with more closely spaced contour points close to the sources result is less calculation time with a higher resolution close to the sources
- Cantilever Option for Barriers: barriers can also be placed on a bridge while the noise propagation underneath is correctly modeled
- Emitting Façade (Vertical Area Source): with indoor/outdoor calculation option and user definable catalogue of insulation materials
- Emitting Roof (Horizontal Area Source): with indoor/outdoor calculation option and user definable catalogue of insulation materials
- Miscellaneous General Purpose Items (DIV-area, DIV-line and DIV-point): in many cases it is not clear what available geographical data actually represents. In those cases DIV items can be used as intermediate storage and viewing with Predictor before converting them into an acoustic relevant item

New Options

- Intuitive undo/redo function (unlimited, restricted only by computer memory)
- Copy and paste items as other item types. This option allows you to import items as DIV items (for example), then view them and decide what type of item they should be. This makes import of data easier as you can decide how to deal with data within Predictor, without having to rely on CAD or GIS software or expertise

- Snapping to items and/or background DWG/DXF files, with user-defined distance offset, makes modeling easier
- Automatic linking of overlapping items for left and right detour calculation. No need for you to select other overlapping items – this makes modeling easier
- Improved modelling of the same items with the options '*OK & Next*' and '*OK & Same*'
- Merging and splitting of polygons for advanced geometrical editing
- Select items inside or outside a user-definable polygon for easier multi-editing of item attributes
- SourceDB+: this new software replaces the Sound Power Manager. SourceDB is very comprehensive software to create your own documented source database with pictures and sound power levels. In addition, formulas can be included to calculate the sound power level of a source, for example, those depending on rpm or electrical power
- Execute Macro Option: This option enables automated geometrical editing of larger models by using the powerful Lima macro language. Each user-definable macro is added to the Predictor menu. Predictor comes with a set of frequently used macros, giving you the benefit of others experience
- Enhanced Table of Results: Allowing ranked source results for multiple receivers to be printed in one go. Also (re)calculation possible directly from the table of results
- Improved printing (including RTF and PDF) including easier, interactive definition and storage of user-defined templates
- Display option for any item attribute as a label on the map for powerful presentation, analysis and reporting
- Multiple background files, including SHP, DXF, DWG, BMP, JPG, TIFF. Support of a wide range of industry standard geo-referenced raster files for easy yet attractive modeling
- Model checking functions 'check links' and 'check model' for possible modeling errors without having to start calculation

Applications and Products

Predictor is available in several configurations to match various applications and budgets. All configurations have the same intuitive interface. All configurations include dual core support and a model license, allowing modeling on several additional linked PCs. A Calculation Client add-on package, BZ-5552, is available with Predictor Advanced Type 7810-B.

Predictor Standard Type 7810-G

Predictor Standard enables you to calculate noise contours for models (typically up to 25 sources) or for more complex situations where only noise levels at noise-sensitive locations are required. Methods included are ISO, ENM, DAL, XPS, Harmonoise, CRTN and RMR-RLM2. It is ideal for consultants who want a general purpose tool for assessment and impact studies for industrial noise and for road traffic noise. It can be used to fulfill the IPPC Directive (96/61/EEC).

Predictor Plus Type 7810-A

Predictor Plus enables you to calculate noise contours for the models used for larger environmental impact assessments. Methods included are ISO, ENM, DAL, XPS, Harmonoise, CRTN and RMR-RLM2. Acoustic Determinator Type 7816 is included to ease creation of sources with real-life data. Predictor Plus is the ideal multi-purpose tool for environmental noise mapping and impact assessment. It can be used to fulfill the IPPC Directive (96/61/EEC).

Predictor Advanced Type 7810-B

Predictor Advanced enables you to calculate noise contours for large models according to the ISO, ENM, DAL, XPS, Harmonoise, CRTN and RMR-RLM 2 methods. Acoustic Determinator Type 7816 and Predictor Analyst Type 7813 are included. Limalink functionality is also included for advanced geometrical processing. Predictor Advanced is the ideal multi-purpose tool for environmental noise mapping, management and impact assessment. It can be used for fulfillment of European Commission directives such as Environmental Noise Directive (2002/49/EC), in accordance with Guidelines on Revised Interim Computation Methods (2003/613/

EC) and the European Commission's Assessment of Exposure to Noise Working Group's Good Practice Guide, and fulfilment of the IPPC Directive (96/61/EEC).

Predictor ISO Type 7810-C

Predictor ISO enables you to calculate noise contours for models (typically up to 25 sources) or for more complex situations where only noise levels at noise-sensitive locations are required. Three calculation methods, all based on ISO 9613: ISO industry (octaves), ISO industry (1/3-octaves) and ISO road (octaves) are supported. It is the ideal tool for consultants who are doing assessment and impact studies for industrial noise. It can be used to fulfill the IPPC Directive (96/61/EEC). In the ISO road method, the Dutch SRM 2 source model for road traffic is included.

Predictor XPS Type 7810-D

Predictor XPS enables you to calculate noise contours for models (typically up to 25 sources), or for more complex situations where only noise levels at noise-sensitive locations are required, according to the French XPS/NMPB, and EU-interim method for road traffic noise. It is the ideal tool for consultants who are mainly doing assessment and impact studies for road traffic noise.

Predictor Harmonoise Type 7810-E

Predictor Harmonoise enables you to calculate noise contours for models (typically up to 25 sources), or for more complex situations where only noise levels at noise sensitive locations are required, according to the Harmonoise Engineering method. It is the ideal tool for authorities, consultants, universities and other educational institutes, who want to use this state-of-the-art method. It was used by the members of Work Package 3 of the European Harmonoise project for validation of this method.

Predictor DAL32 Type 7810-F

Predictor DAL32 enables you to calculate noise contours for models (typically up to 25 sources), or for more complex situations where only noise levels at noise-sensitive locations are required, according to the Nordic DAL32 method. It is the ideal tool for consultants who are doing assessment and impact studies for industrial noise in Nordic countries. It can be used to fulfil the IPPC Directive (96/61/EEC).

Support and Services

A valid Predictor Software Support and Maintenance Agreement gives you the right to all Predictor patches and upgrades within the subscription period, ensuring that you have the latest and best-supported tools. It is also your security for getting quick and professional help when you need it, saving time and money. If you ever experience a software problem with Predictor, the agreement entitles you to support by e-mail and telephone from local and, where required, global Predictor experts. Brüel & Kjær guarantees response to your Predictor problem within two working days after we have received your request. For urgent help, Brüel & Kjær endeavours to provide faster response. The agreement also entitles you to discounts on selected training courses. The first year's subscription to Brüel & Kjær's Predictor Software Support and Maintenance Agreement is included in all packages. To optimise your use of Predictor, we recommend that you ensure that this agreement is valid at all times.

In addition, Brüel & Kjær offers both product (Predictor) and application (calculation and mapping) training courses. Courses are held:

- at the Brüel & Kjær University (at the corporate headquarters)
- at national training facilities
- on-site at a customer location
- as distance learning via webinars

Predictor training courses enable you to get the most out of your Predictor software. Application training courses are not product-specific and give you an insight into calculation software and applications in general, thus improving your use and understanding of them. Holders of a valid Predictor Software Support and Maintenance Agreement get access to all relevant training courses at advantageous rates. See www.bksv.com for more information about training courses.

Functional Specifications

CALCULATION METHOD
Depending on which option is chosen, the algorithm for calculating the propagation of sound from source to receiver in a model is based upon:
- ISO 9613.1 and 9613.2 Industry (International method for general purpose. Octaves and 1/3-octaves)
- ISO 9613.1 and 9613.2 Road (International method for general purpose, including the Dutch road source emission model. Octaves)
- DAL 32 (Nordic industry method. Octaves)
- ENM-link (Industrial noise, links with external ENM calculation core)
- RMR/SRM2 (Dutch rail method. Octaves)
- CRTN (L_{10}) (UK road method)
- CRTN (TRL) (UK road method with L_{10} to L_{eq} conversion according to TRL PR/SE/451/02)
- CRTN (NZ) (L_{10}) (New Zealand road method)
- XPS 31-133 (French road and rail methods based on NMPB. Octaves)
- Harmonoise (European method for general purpose short-term L_{aeq}, including meteorological effects. 1/3-octaves)

MODEL PROPERTIES
Meta Information: Description (45 characters), full length memo, management information (user name and date of creation, date last used, final declaration, project origin), boundaries and calculation method. The boundaries are expressed in metres to 2 decimal places. Maximum coordinates in x and y directions is 10000 km × 10000 km
Specific Information: Items (sources, objects and receivers), groups, calculation parameters, periods (4 basic periods and 1 compound period), results, control values

MODEL ITEMS
(depending on selected method)
Sources: Road, Railway, Area source, Line source, Point source, Moving point source, Emitting façade, Emitting roof
Objects: Barrier (including cantilever option), Bridge, Building, Foliage region, Ground region, Height line, Height point, Housing region, Industrial site, Miscellaneous general purpose items (DIV-area, DIV-line and DIV-point)
Receivers: Receiver point, Horizontal grid, Vertical grid, Contour point

GEOMETRICAL PROCESSING
Actions: Join, connect, split, parallel item, insert/delete node, simplify geometry
Macro Functions: concatenate, attribute calculator, advanced simplify, rectangulate
Functions can be extended by the user

MAXIMUM MODEL SIZE
Grids: 1000000 grid points per grid
Other Items: No preset limits. In practice, depending on available memory and system performance

MAXIMUM CALCULATION SIZE
CRTN and XPS Methods: 1000000 nodes (total for all objects), 200000 source nodes. Larger models can be handled in Predictor Advanced using the Tiling option
Predictor Standard: 250000 source/receiver combinations
Predictor Plus: 2500000 source/receiver combinations
Predictor Advanced: >1000000000 source/receiver combinations. In practice, depending on available memory and system performance

VIEW PROPERTIES
Zoom: To selection, To fit, In, Out, Window, Pan
Items: Specification of colour, shading, symbol, line style, text labels
Background: Topographical maps in various (geo referenced) pixel and vector formats such as BMP, JPG, TIF, DXF, DWG, SHP and MIF
Cross-section: Elevation view of model including ground height at a defined line
3D View: Interactive perspective view of model and noise contours with zoom, rotate and edit option

RESULTS DISPLAY
On-screen: Annotated maps, colour contour maps or tables (see below)
Periods: 4 user-defined (for example, day, evening, night, siesta) plus 1 compound (for example, L_{DN}, L_{den}, etc.)
Table of Results: Shows calculated results at each specified receiver, either total, per group, octave or 1/3-octave values (depending on calculation method)
Table of Comparisons: Shows the difference in SPL between two specified scenarios of the model – a 'before and after' or 'what if' tool, between the model and control values, and the cumulated result of two specified models
Table of Control: Shows calculated values compared to permitted values with ranking to identify possible solutions to noise reduction

CALCULATION
Features: Start, Test, Selective, Stop, Pause, Resume, Batch
Parameters: (depending on selected method) Meteorological Correction, Ground Factor, Temperature, Pressure, Humidity, Air Absorption
Optimisation: (depending on selected method) Fetching Radius, Order of Reflections (up to 10)
Result Storage: Per source, per group or total results

INPUT TO MODEL
Import GIS: In SHP, MIF/TAB, DXF or TXT format
Import Other: From other Predictor projects, from output of Type 7816 Acoustic Determinator software and from output of SourceDB+ software
Digitizer: For specifying item position coordinates, for example, relative to an existing map.
Actual Measured Data: Automatic creation of receiver points from L_{eq}, L_{10} and L_{90} measured with 2260 Investigator™ with GPS positional data
Import of L_{eq}, L_{10} and L_{90} measured with Hand-held Analyzer Type 2250
Automatic creation of point sources from L_w measured with Type 2260 Investigator (with GPS positional data)
Import of L_{eq} data with location identified by GPS from Environmental Noise Management Software Type 7843

SourceDB+ MODULE
Database of sound power in 1/3-octave
Input: Manual data entry
Fields: Description, source, type, drive type, industry type, quality, sound power, measurement method, measurement date, source height, literature references, notes, picture
Filter Options: By any user-selected field

OUTPUT
On-screen: Results displayed in tabular or graphical form
Clipboard: Tables and screen pictures can be copied for inclusion in other Windows®-based programs
Export: To other Predictor projects and GIS systems (ASCII, SHP, MIF/TAB, POI and KML formats)
Printing: Graphical display with extra annotation printable to all standard Windows®-based output devices
Print Model: Print preview available as well as option of selectively removing components, such as GPS reference points and ground regions, from the model as desired. Storage and re-use of multiple print templates possible

ACOUSTIC DETERMINATOR MODULE (Predictor Plus and Advanced Configurations)
See Product Data for Type 7816 (BP 2003)

PREDICTOR ANALYST (Predictor Advanced Configuration)
See Product Data for Type 7813 (BP 2239)

PREDICTOR ADVANCED CALCULATION CLIENT
Two additional licenses with calculation capacity equivalent to Predictor Advanced, works only in same network as a full Predictor Advanced Type 7810-B license
Network Protocol: TCP-IP
Settings: Shared folder, communication port

Computer System

RECOMMENDED REQUIREMENTS
Intel® Core™ 2 Duo Processor 2.8 GHz with Microsoft® Windows® XP, 2 GB RAM, CD-ROM drive, SVGA graphics display/adaptor, mouse or other pointing device
At least 200 MB of free disk space, plus the disk space used as a working area
For calculation of large Predictor Advanced models, tiling is recommended in combination with Calculation Client add-ons and/or the multi-core option for multi-processor computers
Operating System: Predictor works with Windows® XP, Windows Vista™ and Windows 7

Ordering Information

Predictor Type 7810 Version 7 is available in several packages:

Type 7810-A	Predictor Plus Calculates models of ≤ 2500000 source/receiver combinations. Covers all specified road, rail and industry methods. Includes Acoustic Determinator Type 7816
Type 7810-B	Predictor Advanced Calculates models of ≥ 1000000000 source/receiver combinations, includes Predictor Analyst module, in addition to all the functionality of Predictor Plus 7810-A
Type 7810-C	Predictor ISO 9613 Calculates models of ≤ 250000 source/receiver combinations in accordance with ISO 9613
Type 7810-D	Predictor NMPB Calculates models of ≤ 250000 source/receiver combinations in accordance with XPS/NMPB method
Type 7810-E	Predictor Harmonoise Calculates models of ≤ 250000 source/receiver combinations in accordance with Harmonoise
Type 7810-F	Predictor DAL32 Calculates models of ≤ 250000 source/receiver combinations in accordance with DAL32
Type 7810-G	Predictor Standard Calculates models of ≤ 250000 source/receiver combinations. Covers all specified road, rail and industry methods

All Type 7810 Predictor Version 7 packages include the following accessories:
- Program on CD-ROM (all modules included in the one license)
- Program protection key
- License files on CD-ROM
- User Manual

Predictor Software Maintenance, Upgrade and Support Agreement for first 12 months after purchase

Optional Software

BZ-5703	License for using Predictor Plus Type 7810-A on two additional cores on same PC
BZ-5704	License for using Predictor Advanced Type 7810-B on two additional cores on same PC

Both license packages above include:
- License files on CD-ROM

BZ-5552	Predictor Advanced Calculation Client License Pack for Predictor Advanced Type 7810-B Calculation licenses for 2 additional workstations within the same network environment as the Predictor Advanced license

Includes:
- Program on CD-ROM
- Program protection keys (2)
- License files on CD-ROM

Accessories Available

Type 2250	Hand-held Analyzer
Type 2260	Investigator, 2-channel Hand-held Analyzer
Type 2270	Hand-held Analyzer
Type 7813	Predictor Analyst
Type 7816	Acoustic Determinator Software
Type 7843	Environmental Noise Management Software

Services Available

7810-A-MS1	Predictor Plus, Support and Upgrade Agreement (1 year)
7810-A-MS2	Predictor Plus, Version Upgrade and Software Upgrade Agreement
7810-B-MS1	Predictor Advanced, Support and Upgrade Agreement (1 year)
7810-B-MS2	Version upgrade and software upgrade agreement for Predictor Advanced
7810-C-MS1	Predictor ISO 9613, Support and Upgrade Agreement (1 year)
7810-C-MS2	Version upgrade and software upgrade agreement for Predictor ISO 9613
7810-D-MS1	Predictor NMPB, Support and Upgrade Agreement (1 year)
7810-D-MS2	Version upgrade and software upgrade agreement for Predictor NMPB
7810-E-MS1	Predictor Harmonoise, Support and Upgrade Agreement (1 year)
7810-E-MS2	Version upgrade and software upgrade agreement for Predictor Harmonoise
7810-F-MS1	Support & Upgrade Agreement (1 year) for Predictor DAL32
7810-F-MS2	Version upgrade and software upgrade agreement for Predictor DAL32
7810-G-MS1	Predictor Standard, Support & Upgrade Agreement (1 year)
7810-G-MS2	Version upgrade and software upgrade agreement for Predictor Standard
7810-X-100	Upgrade to Type 7810-A from Type 7810-C, Type 7810-D, Type 7810-E
7810-X-200	Upgrade to Type 7810-B from Type 7810-A
BZ-5552-MS1	Predictor Advanced Calculation Client, Support and Upgrade Agreement (1 year)
BZ-5552-MS2	Version upgrade and software upgrade agreement for Predictor Advanced Calculation Client
BZ-5703-MS1	Support & Upgrade Agreement (1 year) for Predictor Plus Type 7812A additional core on same PC License
BZ-5703-MS2	Version upgrade and software upgrade agreement for License for Predictor Plus additional core on same PC
BZ-5704-MS1	Support & Upgrade Agreement (1 year) for Predictor Advanced Type 7810B additional core on same PC License
BZ-5704-MS2	Version upgrade and software upgrade agreement for License for Predictor Advanced additional core on same PC

Predictor training courses
Calculation and mapping training courses

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BP 1602 – 25 2009-10

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